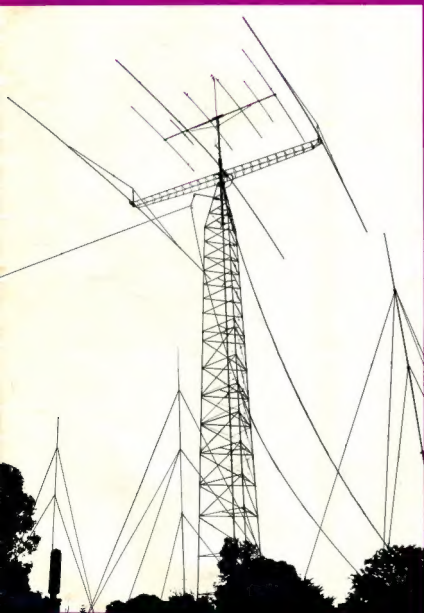


amateur radio

OCTOBER, 1973



INSIDE

- FEEDING 40M YAGI
- CW NET FOR VK
- 5-5.5 MHz VFO
- REPEATER BAND PLAN
- ROSS HULL CONTEST RULES
- INTRUDER LISTING



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FRONT COVER:

40 Metre YAGI at VK3BM
See Article on page 5 this issue

BAND-PLANNING—THE FINAL WORD

For some years now the vexed question of 2 metre band-planning—centred around the frequencies to be used by satellites and repeaters—has been thoroughly thrashed.

Clearly, there is an international problem, directly related to the increasing use of both satellites and repeaters.

Australian Amateurs cannot bury their heads in the sand and "go-it-alone" on what we might prefer to see as maintaining the status quo or saving a few dollars on crystals.

Surely, we as Amateurs must recognize the fact that in the IARU community, although we are entitled to an opinion as Australians, we cannot be so cavalier in our expression of opinion as to ignore an international problem of interference which WOULD be to the detriment of amateurs here and elsewhere in the world in their enjoyment of the facilities which Amateur Satellites make available.

While recognising this aspect, there is, of course, a need to be fair to those users of the 2 metre band whose interests may be other than satellites.

What then are we doing or have we done about solving the problem?

Basically, there have been three major conferences. These were: Wodonga (1968), Albury (1972) and the Easter 1973 Convention.

All were aimed at 2 metre Band-Planning, and they all failed to produce a continuously acceptable plan.

What is a band-plan?

More important; what is an acceptable band-plan?

Presumably, a band-plan is a scheme for maximum utilization of a slice of the frequency spectrum giving the maximum benefit to all users, no matter what mode is employed, with absolute minimum interference between modes or users.

A plan, by definition, is some orderly arrangement of facts, or figures, or other detail—each item positioned relative to the others—and since a plan is something which is projected into the future, it should be as far-sighted as possible; allowing for future expansion or alteration.

This then would appear to be an acceptable band-plan.

The Wodonga Plan seems to meet some of the requirements but does not have an orderly progression about it.

The Albury Plan, although undoubtedly not the only solution to the problem, is favoured by most Divisions and, as a long-term band-plan has more attractions.

Looking at the sorry mess of disension which followed the Easter 1973 Convention, it is not surprising that the South Australian Division's Federal Councillor, in a requisition dated 7th August, 1973, sought an Extraordinary Convention to consider and vote on the 2 metre band-plan.

All necessary provisions of the Companies Act of Victoria having been satisfied, this Extraordinary Convention was held at the lecture room of the WIA, Victorian Division, Melbourne, on the afternoon of Saturday, September 15, and continuing the following morning.

All six Federal Councillors and the Executive were present as well as several observers and visitors.

A communique was issued in time for the Sunday morning VK3 broadcast and the contents were conveyed to Sydney for inclusion in the VK2 broadcast. The following policy was established in respect to the 2 metre band-plan, to be known as "The WIA 2 metre band-plan", which, subject to PMG Dept. approval being obtained, set out the repeater input channel frequencies at 50kHz spacing starting at 146.100MHz, ending at 146.400MHz with output frequencies 600kHz above the respective input frequencies.

Simplex channels were set out at 50kHz spacing beginning at 146.450MHz and ending at 146.650MHz, with 146.500MHz to be developed as the national simplex channel and 146.600MHz as the RTTY channel.

Also implemented was a channel numbering system starting with 144.000MHz as Channel 0 rising by 1 at each 50kHz step.

It was agreed that Channel 4 be changed as soon as possible and that the other existing channels be changed at an appropriate time.

All this, then, is the WIA 2 metre band-plan ready for implementation.

John McL. Bennett, VK3ZA.

VK ZL OCEANIA DX CONTEST

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Sunshine State Convention

6th and 7th October in the Amateur Wrestling Club Hall, 64 Philip St., Leichhardt, Ipswich, Queensland open from 08.30 hours on the Saturday with the official opening at 14.00 hours. Further details obtainable from the Honorary Secretary, W.I.A. Queensland Division, GPO Box 638, Brisbane, Qld. 4001.

Contest Awards

The IARU Calendar for June-July 1973 finds it necessary to issue a reminder that international regulations define a radio amateur as a "... person interested in radio technique solely with a personal aim and without pecuniary interest". Contests whose main prizes are rewards in the form of expensive pre-paid trips violate this principle, and may cause difficulties for the amateur service at future international conferences.

BOX 88 MOSCOW

At the Club Headquarters a full-time staff of 8 is employed in a building of 1800 m. about 19000 sq.ft on two or three levels. Apart from administrative offices, the building houses a library of 48,000 reference books (this figure not including magazines), and about 12,000 technical articles, a reading room, a lecture theatre about the size of a small cinema, a small lecture room, a laboratory and workshop and, of course, a QSL bureau — with a full time staff of four women who handle annually about 2.5 million cards. There are 45,000 licensed amateur operators in the Soviet Union and 4,500 clubs with over 17,000 members. 20,144, writing in Break-in of July 1973 on a visit to "Box 88, Moscow".

Amateur Radio under fire

Where are we heading? Radio Communications of July 1973 carries a leader about "good housekeeping" and comments "At one time it was accepted that the courtesy of the amateur operator was unquestioned, nowadays the manners heard often leave much to be desired. It seems that the standards have declined with the improvement in equipment". The leader not only mentions bad language, the defiance of both the law and reasonable standards of conduct and the activities of pirates but also comments "unless an improvement is effected (it all leads) to the loss of frequencies at the next ITU conference". Reading between the lines this seems to be more or less an international disease which can only lead to a hardening of officialdom towards amateur radio — please pass this on to the rabble.

tuning and feeding a 40 metre yagi

BRUCE R. MANN VK3BM
P.O. Box 724, Swan Hill, 3585.

Most visitors to Swan Hill will be impressed by VK3BM's 40 metre beam which is a prominent feature of the skyline. DX stations are equally impressed by his 40 metre signal. Here's how it was done!

When contemplating the construction of a full sized 3 element 40 metre Yagi I did much searching of books and magazines and much questioning of the "experts" on the DX 40 metre band.

Apart from structural worries there appeared to be 3 major design problems:-

1. The lengths of the elements
2. Coupling the feedline to the antenna
3. The feedline itself

PROBLEM 1.

I came across various references to change of resonant frequency of a Yagi if tuned near the ground then elevated to the top of a tower. Seemingly it should be tuned at least a half-wave above ground if the resonant frequency is to stay put when elevated.

Thus one can readily adjust 2, 6 or 10 metre yagis from a step-ladder — and even 15 metre and 20 metre yagi's well enough — but what-ho a 40 metre beam! That would be a mammoth task even with the aid of the Fire Brigade's motorised ladder!

Then why not cut elements to length by formula? From various sources I found that the usual stepped or tapered elements do not conform to the formula. For instance W3MWC designed his beam with elements stepped from 1 1/4 inch down to 1/2 inch and element lengths cut to formula for 7020 kHz, but when elevated to 100 feet the performance was atrocious! He found that the antenna resonated at 7400 to 7500 kHz, and that an addition of approximately 4 feet was needed to each element to attain proper operation.

So I decided to use un-tapered elements of 2 inch diameter throughout and cut them by formula. Actually aluminium scaffolding tubing was used at the centre of each element and light gauge aluminium tubing of the same outside diameter at the element ends. Joints were made by forcing the tubes until they butted together over a machined section of aluminium alloy rod, then electric welding around the joint. This eliminated the resistance losses common in clamped aluminium joints. The elements were cut to formula for 7100 kHz namely:-

Spacing	20 ft.
Reflector	70 ft. 3 in.
Driven Element	66 ft. 7 1/2 in.
Director	61 ft. 5 in.

To cater for the heavier than normal material and greater wind loading of these elements the 40 foot boom was of triangular lattice steel construction.

PROBLEM 2.

The Co-ax feeder is usually matched to the driven element by the gamma match method but this necessitates a gamma rod with an adjustable clamp at least 6 feet from the boom, plus a variable capacitor in weather proof housing. I couldn't imagine myself adjusting this setup 86 feet up in the air! In any case, users of this method had reported very lopsided field strength patterns. A Tee match was reported to be more symmetrical when used with a balun, but is quite complicated and hard to adjust.

Then over the air came a suggestion which I finally adopted. The driven element was cut in the centre, insulated, and each half attached to the centre conductor of one of a pair of 50 ohm co-ax feeders, the outer braided conductors being joined.

The support and insulation of the two halves of the driven element was achieved by slipping short lengths of polythene tubing over the inner ends and clamping to three feet of impregnated hardwood beam.

PROBLEM 3

The feedline then is a side-by-side pair of 50 ohm co-ax cables with shields connected together, and at the shack end connected to the transmitter through a Johnson Matchbox. Obviously the feed is symmetrical and shielded, giving maximum directivity to the antenna, minimum feedline radiation and lowest noise pickup when receiving and of course a perfect match at the transmitter.

But what of the match at the antenna? The two cables add up to 100 ohms feeding into about 35 ohms — but who's afraid of a 3:1 mismatch at 7 MHz? Not me! The particular co-ax used had a rated loss at 7 MHz of 0.4 dB per 100 feet; and this loss doubles at an SWR of 4:1.

The text book says that most of the loss in co-ax is in the braid, because RF currents tend to go in straight lines rather than follow the convolutions of the individual wires of the shield.

In the double co-ax feeder set-up under consideration the braids are merely shields, not conductors of power so that losses are greatly reduced.

Anyway, what's one dB off an S9 signal? So this homebrew antenna was cut by tape measure, assembled to the homebrew self-supporting tower with feedlines and homebrew rotator connected, and the whole winched up without any antenna tune-up procedure whatever.

IT WORKS!

At 1125 GMT April 4th, 1971 I called a group of five W's who gave me 5 meter readings from 9 + 20 dB to 9 + 50 dB. The symmetry, sharpness and front-to-back ratios are in keeping with the performance, and the Collins O-200 watt power meter permanently in the TX output seldom hits the top pin.

I am sure you will agree, that with this design the problems are all structural — the usual problems of adjustments and tune-up have disappeared. I wish to acknowledge helpful information, ideas and encouragement in this project from VK2AVA and VK3HW.

PLEASE NOTE:

W.I.A. WESTERN ZONE CONVENTION

Owing to circumstances beyond our control Our Convention will now be held on **November 3rd and 4th at Stawell and Hall's Gap.**

Have a pleasant weekend with us in the Grampians area.

For other details refer to September's AR.

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Approved to BS 9114—N002 style 2E—56

SPECIFICATIONS

The 'C' Series of miniature wirewound, vitreous enamelled resistors has been designed to meet the requirements of Specification BS 9114—N002, and full Qualification Approval has been granted. A Test Report Summary is available on request; this report shows that many of the performance levels are in fact much higher than the specification acceptance levels.

The use of specially selected materials, combined with the application of exacting quality control throughout all stages of production ensures the consistent achievement of a very high standard of reliability.

ELECTRICAL SPECIFICATION

Tolerance: $\pm 5\%$ is standard on values of 1Ω and above and $\pm 10\%$ between 0.1Ω and 1.0Ω . For non standard values and tolerances please consult the factory.

Resistance values: C Series resistors are available with the preferred ohmic values of the E24 Series within the ranges shown in Table 1.

Temperature coefficient: Typically less than 100 ppm/°C and never exceeding 200 ppm/°C over the category temperature range -55°C to $+200^{\circ}\text{C}$

MATERIALS

Core: High purity stastite ceramic. Chemically inert, capable of withstanding severe thermal shock and impervious to moisture. Ground to close tolerance finish to give maximum contact with wire element for rapid heat transfer.

Resistance Element: High quality nickel-chrome or nickel-copper alloy depending on resistance value; wound at minimum tension.

End Caps: Formed to close tolerances from a special nickel-iron alloy chosen for its consistent welding properties and glass sealing characteristics.

Leads: Solder coated nickel A.

Uncoated leads can be supplied for welding.

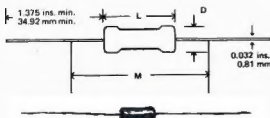
Specify — 'weldable leads'.

Preformed and cropped leads can also be supplied on request.

Coating: Humidity proof vitreous enamel with carefully controlled expansion matched to the materials of the resistor.

TABLE 1

C.G.S.			BS 9114 - N002							STYLE CROSS REFERENCE		
Style	Maximum wattage rating @ 20°C	Resistance Range Ω	BS 9114 - N002 Style	Maximum wattage rating @ 70°C	Approved Resistance Range Ω		Critical Resistance Ω	Limiting Element Voltage, Volts		DEF. 5111-1 Style	DEF 5115-2 Style	G.P.O. Style
		min. max.			min.	max.		Normal	Low Air Pressure			
C3A	3	0.1 10K	2E-56-2.5	2.5	1	4.7K	3.9K	100	70	RWV3J	RFH3-2.5	P.O.35
C7	7	0.1 27K	2E-56-6	6	1	15K	6.8K	200	140	RWV4J	RFH3-6	P.O.40
C10	10	0.1 68K	2E-56-9	9	1	68K	27K	500	350	RWV4K	RFH3-9	P.O.38
C14	14	0.2 120K	2E-56-12	12	1	100K	47K	750	530	RWV4L	RFH3-12	—



Note: M = resistance measuring points distance — below 10Ω only.

TABLE 2

Style	Length L		Diam. D		Measuring Distance M		Approx. Weight
	max. in.	max. mm.	max. in.	max. mm.	± 0.062 in.	± 1.59 mm.	grammes
C3A	.499	12.7	0.220	5.6	1.250	31.8	1.0
C7	.874	22.2	0.315	8.0	1.625	41.3	2.0
C10	1.499	38.1	0.315	8.0	2.250	57.2	3.5
C14	2.106	53.5	0.315	8.0	2.875	73.0	5.0

amateurs assist in air race

Andy Andrews

Secretary, Dubbo Amateur Radio Club, VK29MA

The recent Sydney to Dubbo Air Race has been hailed as a great success and I would like to tell you of a few Amateurs who contributed their time and energy to this object.

About two months before the race the State Emergency Service Signals Section, Macquarie Division, of which I am a member, was asked to provide radio communication facilities for the air race.

Basically what was required in our area was a radio link between Mudgee Airport and the Headquarters at Dubbo and also a radio link between the marker area which non-stopping planes flew over and identified to Mudgee Airport a distance of about four miles.

The main link between Mudgee and Dubbo was to be with the State Emergency Service SSB sets on their frequency of 3743 kHz, whilst the local link was to be with "Pony" transceivers on 27.230MHz.

Some doubt was expressed on the reliability of the HF communications link due to the normal daytime conditions on the 80 metre band and it was decided to invite the Amateurs in the area to participate in setting up a secondary channel on 2 metres through the Orange Amateur Radio Club's repeater on Mt Canobolia, VK2AOA-R1 (FRED). The Amateurs showed great interest and many points were discussed on the 7.30pm rag chew on following evenings.

On the Sunday preceding the race the SES contingent for Mudgee went to the Airport for a dummy run on their equipment and to erect a 60ft mast to take the 80 metre inverted V. Robert Alfrod, VK2ZJR and Alan Wright, VK2BVL made the trip from Orange.

Meanwhile, at Dubbo, Ces Kearnes, VK2AKC had constructed a 2 metre beam from 8 gauge fence wire with an SWR of 1-1.5, (we will have to check his SWR meter) and this had been fixed to the roof of the SES Headquarters at Dubbo, and no difficulty was experienced in triggering "FRED" at Orange.

Robert and Alan at Mudgee experienced difficulty in getting through to the repeater using a ground plane and it was obvious that further thought had to be given to the matter. The SES HF system to Dubbo worked perfectly but the important link between the marker area and Mudgee was poor.

During the next week an offer by Tom Stroud, VK2AMR for the loan of his beam and a mast was quickly accepted. It was dismantled and taken to Mudgee and a quick test with the little KEN 2 Watt transceiver showed that the 2 metre link to Dubbo via FRED was established.

Dawned the race day and Robert arrived at Mudgee from Orange at the early hour of 7.00 am complete with beam and ground planes attached to the roof of his car. After erecting a ground plane at the Airport he joined the frozen band of stalwarts in a frost covered paddock four miles away. A fire that had

been started to provide some warmth had to be extinguished as the smoke was concealing the marker from being seen from the air. Robert erected a beam on a pole in the middle of the paddock and established a Channel B 2 metre link back to the base, and for the rest of the day he was kept very busy transmitting the marker changes and the identification numbers of the planes that passed overhead. Bill Baylis, VK2BVW and Ken North, VK2ZAN travelled up from Bathurst to assist.

Due to the exceptional conditions on 80 metres the Secondary 2 metre link to Dubbo was not used. However, after the race was over the Controller of the Macquarie Region SES was able to talk to his Mitchell Region counterpart in Bathurst (Bill Baylis) over the 2 metre Fred link and was impressed what can be done with VHF and a Repeater. ●

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You and DX

COUNTRY CRITERIA. What constitutes a 'country' for the purposes of the IARU awards (WAC, WAZ)? IARU Region 1 News of Aug. '73 lists 4 criteria summarised below.

Firstly a Government-Administration 'country' is an area by reason of Government or a distinctively separate administration constituting a separate entity. (Comment by an ignorant DX'er — how come, then, that GM and GW are separate 'countries' but not VKI and VKJ, etc., or are the latter States considered to be in the same category as the States of the USA?)

Secondly in two bites are islands and groups of islands. An off-shore island is a separate 'country' if it is not less than 225 miles of open water distant from the mainland provided the island is not part of or located adjacent to an island group. An island group must be at least 500 miles of open water away from anything administered by the same government or administration.

Thirdly two pieces of a country listed 'firstly' above which are completely separated by a foreign country must be at least 75 miles of land apart.

Fourthly any unadministered area is ineligible for consideration as a separate entity.

It is always interesting to consider the variations and implications of separate 'countries' status for different awards and purposes. It is also interesting to observe how the rules of various awards in relation to country status can be applied to uninhabited pieces of rock or sand scattered over the face of the globe. Remote places such as Rockall and a few reefs await activation one day but others once thought nearly impregnable such as Bouvet have succumbed. What price the DX activation of space vehicles? Would such be a separate country perhaps?

Verona. The Netherlands Antilles amateur radio society celebrates its 25th anniversary with a special activities month during December 1973 when the PJ2 stations will be using the PJ1 prefix. The Secretary of VERONA also advises that the beautiful Curacao Certificate will be issued free for working three PJ1 stations during December 1973. Applications by air mail, with details, before 1st February 1974 to P.O. Box 383, Curacao.

City of Joao Belo Award. The Mozambique Society advises that a special award will be issued to anyone working CR7CJB plus at least one other of CR7ER, CR7LZ or CR7RA in the period 1st to 31st October 1973 on the DX bands 40 to 10 metres. Send QSL cards to Camara Municipal de Gaze, P.O. Box 14, Joao Belo, Mozambique. ●

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HEATH

Schlumberger

the CW net

a first for Australia

F. J. Miller, VK4II

95 Stanley Terrace, Taringa, Qld., 4068

An activity has recently started up on 40 metres which might well be the first of its kind ever. A group of CW ragchewers discovered that if they organised their round-tables along rudimentary traffic net lines, a degree of freedom was achieved which the good-natured chaos of random break-in could not offer.

This group of east coast VK stations, which had been meeting informally over a period of time before the idea of a net was hit upon, recognised the possibilities of an improved ragchew session which maintained order by the simple expedient of setting up a control station whose function it would be to assemble all the parties together and then pair them off for short QSO's. The concept of course was basically different from the round-table format it began from, but it had the advantage of enabling people to come and go as they pleased and it offered each person the chance to do more operating himself.

It was felt by many that the round-table seemed somehow to get monopolised by the most talkative ones and it was difficult to remember all the calls in order, and all the names, not to mention the problem of copying the weak fellow who seemed to invariably get clobbered by a break-in station . . . what a mess it became at times, and how hard it was to politely escape from.

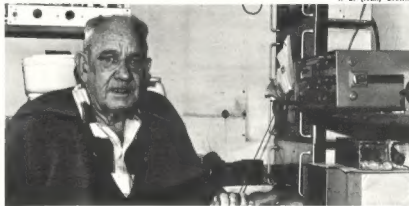
Thus began an exciting activity which has been running successfully and in earnest for over 20 weeks, with a typical weekly attendance of 14 stations. On the low end of 40 metres each Sunday morning, a lone station calls CQ CWN* and with that invites all interested CW stations to call in and relax while he proceeds to pair one station off with another and suggests a frequency to shift to. When each station has acknowledged that he has his information, he is on his own. After a pleasant QSO and a chance to get in some real operating (not always possible in a round-table) one returns to the net frequency, reports in, and awaits another assignment. Code speed is not a problem because if you are slow, the net control station (NCS) will oblige by finding someone who prefers to go slow too. If it is speed you are after, there is always someone who will take you on. Best of all, if you want to bow out for whatever reason, just tell the NCS . . . no messy apologies needed. The CW Net concept is simple: drop in for the fun and leave when you choose. No need to wait interminably for a chance to break in or to leave.

The current net procedures have evolved from early attempts at efficiency through rigorous use of the QN code (the ARRL traffic net Q-code) to the present neat but casual



VK2RY

I. L. (Ivan) Brown



VK2AHR

R. (Dick) Ellis



VK2AV

A. W. (Art) Thurston



YK8ADY
C. M. (Mac) Hicks

procedures involving mainly the signal QN ("I report in") and one or two others such as QNX ("I request to be excused for a while") and QNO ("I'm off, cheers"). The NCS uses such QN codes as QND ("Net is underway") and QNF ("Net is finished for today").

Several ARRL publications list the QN code, but even if one did not at first know a single Q signal the NCS would understand and pair you off anyway.

If you wanted to get in touch with someone in particular whom you were not

sure was on the air, a check call to the NCS would sort the problem out without formality other than a quick report in and out. Formality is purposely kept to a minimum because experience to date has shown that rigidity creates its own problems not the least of which is early waning interest. To keep order, however, demands competence on the part of the net control station which might appear to require a superman, but this has not proved to be at all necessary. Those stations who have volunteered to be NCS have among themselves evolved a simple logging system which works well and is easy to learn. (The logging and control technique is available from the author.)

Thus far the NCS role has proved very popular and there has been no reluctance by operators to give it a go. There are always a sufficiently large percentage of NCS oriented people to fill this role and so far no-one has felt pressured to have to offer his services.

To date the net has been limited in its operation to a two hour period on Sunday mornings** and for an average attendance each station enjoys up to 5 QSO's. Due to skip conditions on 40 metres the activity has been centred on NSW and Victoria, but stations from VK5, VK4, and ZL are heard regularly.

What is needed now is decentralisation, both as to operating bands and geographical regions. Currently an 80 metre CW Net is in the embryo stage. Judging by the genuine and continuing interest shown in the net so far, it seems likely that the ragchew net concept could attract interest overseas as well. Perhaps the real strength of the net lies in the fact that it does not discriminate. All CW operators are encouraged to join in, although speeds of under 15 wpm do make

** CQ CW Net
** 7025 KHz 0830-1130 Eastern Time

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a VFO for 5-5.5 MHz

Drew Diamond, VK3ANU

55 Wimbira Parade, Ashwood, 3147

Here is a modern solid-state VFO designed for easy construction using locally-available parts. This, allied with its excellent performance, may well make it the VK amateur's standard VFO.

Many transceivers today use some form of frequency synthesis or mixing process to derive a desired output frequency.

The mixing method is a very good one for several reasons, one of which is excellent frequency stability. For example, if an output frequency range of 28.0 to 28.5 MHz is required, it could be obtained by mixing 5 to 5.5 MHz and 23 MHz, the latter being furnished by a crystal oscillator. Using this method, the stability of the output frequency will be similar to that of the 5 MHz component, any drift which may occur in the crystal frequency being relatively small.

To derive a stable output frequency it only remains therefore, to provide a source of 5 to 5.5 MHz signal which, when set to the required frequency, will continue to maintain that frequency, and not be affected by the changing environmental conditions the oscillators may undergo during a communication period.

Using this method of frequency production, the VFO can be allowed to run continuously, preferably 24 hrs per day.

The VFO to be described here will provide such a variable source. Frequency range is 5.0 to 5.530 MHz. Stability is in the order of 2 parts per million per hour after warm up. The frequency curve can be linearized using the split segments of the capacitor shown. Output voltage is 3 volts peak to peak sine wave into 1000 ohms. Supply requirement is 12.6 volts at 25 mA. A supply voltage change of plus or minus 1 volt will result in a frequency change of about 1 Hz.

A FET is used as the maintaining device rather than a bi-polar transistor in the interest of improved stability with changes in temperature.

The components of the oscillator and buffer amplifiers are laid out on an etched fibre-glass board measuring 7 x 9 cm. Good mechanical stability can be secured using the form of construction shown, a U shaped box and cover measuring 15 cm long, 6.5 cm high and 8.5 cm in width.

An ordinary ¼ inch solid coupler is used on the capacitor shaft inside the VFO box and a plastic rod should be used to connect the capacitor with the drive mechanism. A number 3 knitting needle is exactly ¼ inch in diameter.

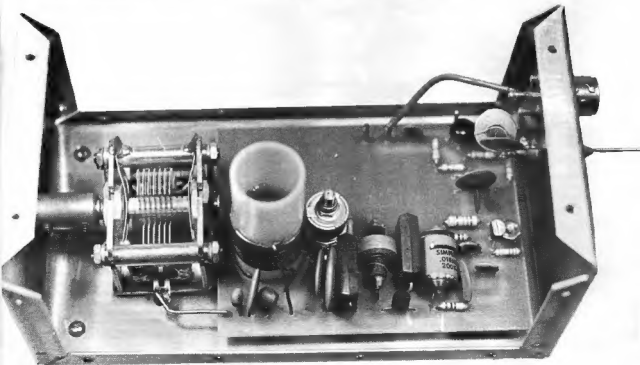
The entire box is mounted on four ¼ Whit. screws which are secured to the main exciter chassis through four rubber grommets which provide some mechanical, electrical and thermal insulation. A considerable improvement in stability can be obtained by enclosing the VFO box in one inch thick

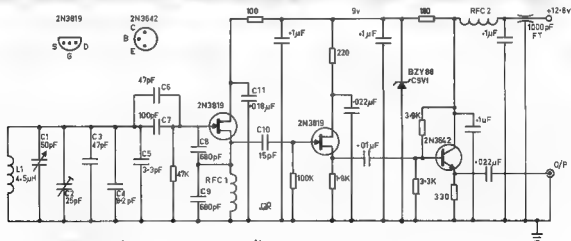
polyfoam insulation. The coax from the VFO output socket provides the earth return for the supply.

The capacitors used at C4 and C5 are ceramic N750 type for frequency drift compensation. The values shown were arrived at after some experimentation with temperature versus frequency. It will probably be necessary to find the exact amount of capacitance by similar experiment. If the frequency increases with temperature, there is too much negative capacitance, if the frequency decreases with increasing temperature, there is too little. Use C2 to restore the correct frequency range. Remember to give the components time to reach room temperature after soldering before taking frequency measurements. If a very stable VFO is required, you must be prepared to spend some time in determining the exact amount of capacitance required.

The author spent considerable time experimenting with various types of coil formers and fixed capacitors in the tuned circuit. A good quality ceramic coil former is ideal of course, but here in Melbourne there appears to be no ready supply. The former finally used was a WYNNE ¼ inch available at Magrath's.

An output waveform which is distorted may be traced to a FET which has too much gain. As 2N3819's have considerable parameter spread, it may be necessary to try a few FET's in order to obtain a clean output waveform.





- C1 50pF Variable Polar C28/141 or similar
 C2 25pF Trimmer C005 BA/25E
 C3 47pF Ceramic NPO
 C4 8-2pF " N750
 C5 3-3pF " "
 C6 47pF " NPO
 C7 100pF " "
 C8 680pF Silver Mica
 C9 680pF " "
 C10 15pF Ceramic NPO
 C11 .018uF Styrofoam
 All other capacitors as shown

All resistors $\frac{1}{8}$ watt 5%

L1 4.5uH, 17 turns 18swg enamelled
 copper on $\frac{3}{16}$ " Wynne former.
 Start and finish held in place with
 a small amount of Araldite.

RFC 1 2.5uH Single pie (Amgis)
 RFC 2 2.5uH " " "

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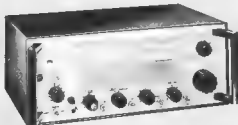
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Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3105

The Transistorised Signal Injector: How it works.

Last month I said that an audio oscillator, like the YRCS one described last month, also produces RF signals. If you are new to electronics you could be excused for thinking I'm talking through my hat. Not all audio oscillators produce RF signals, thank goodness. The conversation this time will concentrate on the multivibrator type of oscillator, such as the unit shown in Fig 1 of September 73 "Newcomer's Notebook".

Consider that transistor TR1 has a Beta of 100 and TR2 a beta of 80. Beta can be very roughly equated to gain, meaning that 1mA of base current in one transistor will cause 100mA to flow through the collector junction. There are other factors which come into this but for the purpose of this explanation I will keep it fairly simple. When the multivibrator has supply voltage first applied, TR1 draws slightly more current than TR2 because of its higher beta. This means that the voltage at the collector of TR1 will be lower than TR2. This also means that the voltage across C3 is more negative going than across C2. Negative going doesn't mean negative, it means going in a negative direction with its positive potential decreasing or if already negative, the negative potential is increasing further. The negative going voltage across C3 causes TR2 to be biased off. In other words the voltage applied via C3 to the base of TR2 nullifies the voltage applied across R3. As TR2 is being cut off the voltage at the collector is positive going and is applied via C2 to cause TR1 to turn on harder to the point of saturation.

With TR1 turned on hard and TR2 cut off a temporary state of quiescence is reached. C2 is initially uncharged when TR2 is cut off and as such has no voltage across it. Therefore the base of TR1 can be considered to be at full + potential. As the capacitor C2 charges via R2 the base forward bias decreases. C3 is gradually discharging at this time and the base of TR2 is gradually coming away from deeply inside cutoff. When the base of TR2 reaches conduction point at about 0.6 volts a small amount of collector current is drawn. This will mean that the voltage at the collector will be slightly less positive and a negative going pulse will be transmitted across C2 which will pull TR1 just slightly away from saturation. Therefore the collector voltage will rise going slightly positive. This positive pulse is transmitted across C3 causing TR2 to draw more current so lowering its collector voltage. This causes an increase to the size of the negative going pulse applied via C2 to TR1 which is

progressively cutting off TR1. This regenerative action continues very quickly until TR1 is cut off and TR2 is conducting into saturation. Changing over from conduction to cutoff can be accomplished in a microsecond or so. The length of the quiescent state, though, is controlled by the time constants of the resistors and capacitors used in the device.

In essence the multivibrator just discussed is a square wave generator. Square waves in fact can be mathematically shown to contain all frequencies which are harmonically related to the fundamental oscillation frequency. Therein lies the clue of how an audio oscillator can produce an RF signal. The waveform of the multivibrator isn't quite a square wave so its output does diminish as the frequency rises. A typical output waveform is shown in Fig 1 of this issue. The unit under discussion will give output to at least 2MHz. The higher in frequency you go the less the output there is from the unit.



FIG. 1

How to Use the Signal Injector.

The signal via the probe can be injected into any audio signal circuit by placing the probe onto any part of the signal path through the amplifier. If placed on the speaker don't expect to hear a loud noise, in fact you will barely be able to hear it at all. The base or grid of the last audio stage will produce higher volume, and the base or grid of the preceding stage considerably more. Once you get to the diode detector the volume may be slightly down on what you obtained at the input of the following stage. If you now start to work your way towards the front end of the set you will find the level of the output from the speaker increases. At the collector or plate of the last IF stage you will find that the output is quite low after having been high in the first stage of the audio section. The reason for this is that the probe has a much lower output at RF frequencies than at audio. As you once again progress towards the front of the set the level of signal should once again increase.

To get the hang of the multivibrator signal injector, it is desirable to try it on several sets both valve and transistorised. You will get an idea of the level of signal that can be expected in various stages by doing this. One point I wish to bring to your attention again is the one I mentioned last month, namely NEVER use the earth lead when you are putting the probe onto a point of high potential above earth.

The multivibrator signal injector is a very handy instrument for the amateur and for the professional radio man. I consider that this is one of the handiest "dynamic" testing instruments for the amateur shack. This particular article wasn't written on test instruments as such, but has ended up being a

write up of a particular instrument. Other instruments will be written up soon. One method of increasing the output from the signal injector is to increase the supply voltage. Subminiature batteries giving up to about 6 volts could be used, and considering the current drain should last a long time. At 6 volts the current drain would be in the order of 4 mA.

Another method of obtaining output at higher RF frequencies would be to replace the transistors used with transistors known to be good at HF and possibly VHF. The switching time from cut-off to saturation and vice-versa is likely to be shorter with the HF or VHF transistors. This means the front and back slopes of the "square" wave output are steeper so causing more of the higher harmonics to be produced. It is possible to do quite a few experiments with these multivibrators until you get the results you want. The multivibrator that has been discussed is called an "a-stable multivibrator", there are two other types "bi-stable" and "mono-stable". The latter two are used extensively in digital electronics.

Notes

Next month I hope to describe some accessories for converted domestic mantle receivers. I promised it about a year ago, so it is about time. The planned low power 160 or 80 metres transmitter hasn't as yet got off the drawing board. It will, but regrettably will be delayed a few months.

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After looking at the FT 101 over the last two months, we are now going to step back a few years to the 101's predecessor, the FT 100. Many of these rigs are still giving excellent service and can often be obtained on the second hand market at quite reasonable prices.

The service data that follows is again due to the generosity of Mr Fred Ball of Ball Electronic Services.

SYMPTOM. Low kick-up on speech. Meter kicks normally on whistle or high pitched sounds.

Probable cause. Earth point of emitter bypass on TR 308 (first mic amp) not earthed (IC322)

Cure. Resolder the condenser leads.

SYMPTOM. Cross modulation.

Probable cause. Protection diodes D106-D107 incorrectly positioned in circuit.

Cure. Check that the diodes are on the receiver side of trap L608 as shown on the circuit. If they are on the antenna side, B C break-through will then result

SYMPTOM. Oscillation in the IF stage.

Probable cause. Coupling between IF transformers 1, 2 and 3. Coupling can occur between the tuning slugs.

Cure. Screw slug through to bottom side of one coil only, instead of top side for resonance as is normal

SYMPTOM. Receiver very weak.

Probable cause. Dry joint at band switch to coil

Cure. Resolder condenser. Also check RF transistor TR 101 and alignment.

SYMPTOM. Intermittent operation for all but CW-Tune position.

Probable cause. Stress on chassis could cause short with coax braid and mode switch lug.

Cure. Adjust stress on chassis. Check that no leads or wires are jammed under control fixing nuts etc.

SYMPTOM. Delay too short in VOX operation.

Probable cause. Lack of capacity in timing circuit or resistance too low.

Cure. Check value of timing resistor. If low, replace, or if OK, add extra capacity to delay circuit.

SYMPTOM. AM modulation downwards.

Probable cause. Poor SWR

Cure. If unable to reduce the SWR try adjusting the IC on AM for best upward modulation.

SYMPTOM. Pulling or FM-ing of VFO on voice peaks.

Probable cause. Defect in voltage regulator causing slight variation in regulated voltage to VFO.

Cure. Check VR components. Check that VR circuit has correct input voltage. If fault exists only when operating on 12 volt DC power supply, check that battery voltage is normal. Excessive Mic Gain with resultant high peak current on speech can result in VFO FM-ing.

SYMPTOM. VFO OK on receive, but drifts on transmit.

Probable cause. Faulty conductivity in RFA circuit, probably via relay contacts in RL 301

Cure. To check this, try interchanging the plug in relays RL 301 and RL 302. Clean the relay contacts and retension the springs.

SYMPTOM. "S" Meter reads high on SSB with no signal input.

Probable cause. Oscillation in IF stages or carrier leakage in IF.

Cure. Check IF alignment. Check carrier oscillator (BFO on receive) and adjust to correct frequency. Also check transmitter carrier null.

SYMPTOM. No drive on transmit. Receive OK

Probable cause and cure. Diode D304 open circuit. replace.

SYMPTOM. Little or no "S" meter reading. Meter reads OK in transmit mode.

Probable cause. Meter circuitry defective.

Cure. Check relay RL301 contacts that change over the meter functions. Clean and retension. Also check "S" meter transistor TR205

SYMPTOM. Advancing RF gain beyond half scale causes volume to decrease and "S" meter to rise. (Voltage on AGC line rising).

Probable cause. Zener diodes at RF amplifier emitter reversed or open circuit, or not properly soldered in.

Cure. Check diodes and resolder.

SYMPTOM. Receiver audio output distorted

Probable cause and cure. Output stage transistors faulty. Replace both 2SB200 output transistors.

SYMPTOM. No output or very low output on transmit. Preselector tuning broadly and incorrectly

Probable cause and cure. Fault in driver stage. Replace RFL L119 plate feed to I2BY7. This choke can overheat and become distorted although not actually burnt out. Turns can apparently become short circuited. Agis type CA is a suitable replacement.

SYMPTOM. Oscillation in the receiver RF amp.

Probable cause and cure. Excessive gain in the RF section. Try connecting a 22K ohm resistor across the RF coil.

Y.R.C.S.

with Bob Guthrielet

Methodist Manse, Kadina, S.A., 5554

A few weeks ago I received a letter from M. H. Hyde, (VK8NH) informing me of his appointment as the Supervisor of YRCS in WA. In offering our congratulations, we respond to his SOS for assistance in terms of which I quote: *I have recently taken over*

the Co-ordination of the Youth Radio Scheme in WA, and would be grateful if you could make this known in Amateur Radio. As my records are somewhat incomplete, I am anxious to hear from any individual or organisation involved with the Youth Radio Scheme in WA. I can be contacted — Hamilton Senior High School, Purvis St, Hamilton Hill, WA, 8163 (Tel 37 1740, and 67 Hennessy Avenue, Orelia, WA 6167 (Please help if you are able).

Another important item is that referred to in a letter from Rex Black, VK2YA. Rex emphasises the importance of club members being given guidance when appearing for interviews for jobs. Suggestion is that the potential employee should take a suitcase with his best electronic project, and demonstrate and discuss it from the technical point of view. Will club leaders consider this idea?

Have received a copy of the YRCS News Release Sheet published by the VK2 boys under the guidance of Kev Watson. This is something which could be profitable in all States and enable supervisors to keep in touch with the clubs under their control.

It is now over ten years since the formation of YRCS and with many of our testing problems overcome, I believe the time has come when we could accept some responsibility for helping ourselves financially. The present situation is that we are dependent on local VWA Divisions and Fed VWA for support which has been given willingly. On the Federal level, YRCS has to rely on help in the form of postal rates, stationery, telephone, etc. If the 200 clubs in Australia contributed the small sum of \$1 per year, we could establish a fund which would enable us to function more efficiently. Will State Supervisors think about this suggestion, and act accordingly?

AARTG

with Ken Kelly VK4MJ

285 Monaca Street, Surfers Paradise, Qld., 4217

During August, meetings have been held in Brisbane and Perth, leading to the formation of the Victorian Australian Amateur Radio Teleprinter Group. Although the constitution has yet to be ratified by the V.A.I. it seems that the new group is now off the ground.

The first meeting was held in VK8 early in August and there are already 18 members. The Secretary is Alan Gibbs, VK8PG, 12 Munyard Way, Morley, WA 6062, and interested persons in that area should get in touch with him. The members to date are VK 6 — VW, WA, PG, NT, NE, KR, IX, IQ, HK, CW, LF, VK NK, QJ, and JR. The state chairman is VK8NT.

Later in August a meeting was held in VK4, and was attended by 12 hams. It was decided to form the VK4 Divisional Group, and a provisional constitution was agreed upon. This will be considered by the VK8 group and when passed upon by both groups, will be forwarded to Federal Executive of VWA for approval.

It has been noted that there is now some activity in VKCS, and we hope that it may be possible to form a group there also in the near future. In Qld and VK2 those active on RTTY appear to rather favour joining a new RTTY group being formed by the Eastern & Mountain District Radio Club of Victoria. While we are disappointed that there is some fragmentation of RTTY interest in this way, we are pleased that there will be an active group operating, and hope that the two bodies will be able to co-operate to the advantage of both.

We have reason to hope that a large number of page printers may become available shortly, and that many who are interested in this mode will be able to join the ranks. In the meantime, we will try to populate the RTTY frequencies in WA, and be able to find more stations to work within Australia than has been possible up to the present time. Frequencies most likely to be active at the present time are 3590, VK6 net on Mondays at 0001Z, 3540, 7005, 7040, 14085 to 14095. A general net is at present held at 0800Z, Sundays on 14085KHz.

Anyone who is interested may receive further information by writing to the address given at the head of this column and all enquiries will be welcome. Those who wish to join, and who reside in a State in which a group has not yet been formed may be attached to the group of another State for the time being.

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Transistor only (2N5505)	\$7.75	all P&P 50 cents	

Data sheets on transistors available separately 10 cents (P&P 20 cents). The prototype shown here was built by Dick Smith himself. It worked despite a few short circuits. If he can get one going anyone can!

ARRL PUBLICATIONS

Check the reviews we gave in August. These books are now being imported direct from the U.S. They are excellent value. The Radio Amateur's VHF Manual

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PL250 UHF type line plug for LR57 or RG58u coax	50 cents	L734/J wire socket	50 cents
C32-270 UHF chassis mounting	50 cents	L804/S Chassis socket	40 cents
BMK type line plug	\$1.15	L816 Joiner	40 cents
BNC chassis socket	\$1.80	UG175 Adaptor to allow RG58u, coax into PL250 plug	40 cents
Belling Lee L734/P Line Plug	40 cents		

DIGITAL ENTHUSIAST'S CORNER

B5700 Neon Numerical Indicator tubes (Nixies) give the largest possible numeral in a standard glass tube—over 13mm tall. TTL compatible and operates from 200V, output is 200Ft Lambert \$395 each (Full data in New Catalogue or send 10c).

Litronix Seven Segment LED Displays give easy-to-read 0.3" character from a 14pin DIL package, easily read from 10ft away. Common anode display giving red numerals. Datalit 707 \$5.90 each.

Flex Key Elastomer Keyboard for your data entry. Uses the latest carbon silicone polymer bonded to printed circuit substrate. Gold plated contact grid on glass epoxy. Legends silk screened on back of Mylar legend sheet. Directly compatible with DTL, TTL, MOS and CMOS. Single pole momentary contact with one common terminal to all switches. 12 key type 12DK26 \$14.50, 16 key type 16DK1B \$16.90.

HEATSINKS

World famous Redpoint heatsinks improve reliability. Did you know every 10°C rise over 50°C halves reliability?

Type 5F for TO-5 transistors Thermal Rating 50°C/Watt 25 cents each Thermal Rating 105°C/Watt 60 cents

POWER HEATSINKS

W type in 2" lengths at	\$1.35	Measure 1 1/2" high by 5 1/2" wide, ratings are 1.5, 1.5 and 1.3°C/Watt respectively.
W type in 3" lengths at	\$1.75	
W type in 4" lengths at	\$2.50	

Dick please send me a copy of your new 64-page catalogue I enclose 30 cents towards post and packing

Name

Address

Postcode

DSE

DICK SMITH ELECTRONICS PTY. LTD.

ELECTRONIC & COMMUNICATION ENGINEERS

162 PACIFIC HIGHWAY GORE HILL P.O. BOX 747 CROWS NEST 2065 439 5311 (5 LINES)

ASSOCIATED COMPANIES

DICK SMITH (SALES) PTY LTD DICK SMITH (WHOLESALE) PTY LTD DICK SMITH COMMUNICATIONS PTY LTD

The CW Net — (Continued from page 5)

the going rough at present. The simplicity of the concept offers to any group the opportunity to form a net to suit themselves.

There are still a fair number of CW operators active today, but it seems that their numbers are not growing. Possibly the convenience of SSB has wooed many away, or perhaps it is just another facet of the trend today to give in when the going gets tough, and CW is tougher to master than phone operation. What the CW Net philosophy offers is an opportunity for those radio

amateurs who would like the chance to have on the air practice to get some without fuss. It encourages proficiency which is an end in itself and helps alleviate the bandwidth problem which, despite the improvement brought about by SSB, offers a further fourth improvement. For the casual QSO where speed of communication is generally irrelevant, CW says it as well and offers the added satisfaction which comes to those who can do something which apparently others cannot.

It has been suggested that if the world population growth rate were applied to the

radio amateur population, with a 20 years there would not be space available for voice communication in the medium frequency bands. Will that day sound the death knell for the hobby? I think not. It is more likely that the CW operator will continue as he always has enjoying the fruits of his efforts and the pleasure of his hobby.

It is the aim of the CW Net activity to offer the opportunity for more CW activity on the bands now. The author would welcome comments on this article and extends to all operators the invitation to listen in to the CW Net and judge it for themselves.

SIDEBAND ELECTRONICS ENGINEERING

For the time being we now know where we stand with respect to the BY-LAW import duties exemption on HF transceivers. A firm order, 50% deposit, three photocopies of the footsack size amateur stations license and the paperwork will be done for you! There is a 3 to 4 weeks delay and sets are mostly in stock in bond-storage, although not always as at my prices it is hard to keep up with the demand!

Meanwhile, many prices of equipment have gone up overseas, CDR rotators, HY-GAIN antennas by almost 10%, BARLOW-WADLEY XCR-30's have to be paid in South African Rands that now are 7 per cent dearer than before. As a result the benefit of the reduced import tariffs has all but been nullified again. Sorry, INFLATION is a world-wide disease! Here we go:

YAESU MUSEN FT 101 complete with CW filter, cooling fan, crystals for all channels, 160 Meters down FT DX 401 \$560
 FT/FP 200 combination \$450
 YC 355 D digital frequency-counter 0-200 MHz \$340
 SORRY, all FT 2 FB 2 Metre sets sold out.
 FT 101 CW filters \$30
 FT 101 cooling fans \$20
 FT DX 400/580/401 noise blankers \$20
 FT 101 (older models) conversion kits \$50

MIDLAND PRODUCTS Model 13-869 CB 23 channels 5W AM 12 V DC \$90
 Model 13-894 CB 5W AM-10W SSB 23 channels 12V \$175

Model 13-856 5W AM 27880 kHz 12V DC for marine operations, with microphone \$75
 Model 13-700 S 1W walkie-talkies 7240 kHz \$40
 One Watt De Luxe model walkie-talkie \$50
 SWR meters 52 ohm twin-meter type \$16
 SWR meters, single meter type also FS-Meter \$12
 PTT hand-held 50K ohm dynamic microphone \$10
 Crystals for various 27 & 28 MHz channels p.pair \$3

BARLOW-WADLEY XCR-30 Mark II continuous coverage receiver 500 kHz to 30 MHz, crystal controlled, still only \$225

Large Selection of HY-GAIN ANTENNAS
 14 AVQ vertical, no guys required, 10 to 40 M 16' tall \$85
 18 AVT WB vertical, no guys required, 10 to 80 M 23' tall \$85
 TH 3 JR 10 15 20M. 3 el. Junior Yagi beam 12' boom \$100
 TH 3 Mk 3 10, 15, 20m. 3 el. 1 KW Yagi beam 14' boom \$145
 TH 8 DXX 10 15 20 M. 6 el. 1 KW Yagi beam 24' boom \$175
 HY-QUAD 10 15 20 6 element Cubical Quad 8' boom, single feedline \$130
 204-BA 20 M. 4 element 1 KW Yagi 26' boom \$155
 BN-86 Hy-Gain balun only for buyers of Yagi beams \$18
 Baluns of local production, excellent finish \$15

CDR ANTENNA ROTATORS
 AR 22 R \$40
 HAM-M senior \$130
 Both with 230 V AC Indicator-control units

144-148 MHz EQUIPMENT

KEN PRODUCTS KP-202 144-148 MHz 2 Watt output hand-held transceivers, with the hottest receiver of the lot, bar none, provision for 6 channels, crystals for 4 channels provided, 144.48, 144.60 plus a choice of channels A or B and Repeaters 1 or 4 \$150
 Extra crystals, per channels \$8
 10 NI-CAO batteries with KEN battery charger \$35

BELCOM LINER 2 Solid State 144 MHz SSB transceivers, 10 Watt output, 12 V DC operation VFO coverage 144.000 to 144.240, 144.240 to 144.480 MHz, with clarifier, noise blanker, squelch, mobile bracket and P.T.T. microphone, 27 translators, 6 FET's one I.C. and 44 diodes \$330

SWAN TV-2C 144 MHz transverter, 28 MHz input, 240 Watt PEP output on SSB, receiver convertor noise-figure less than 3 db with two FET r.f. stages and FET mixer, 5894-B transmitter output stage, to be powered externally from the supply of the driver-transceiver \$430

SWAN VHF-150 144 MHz linear amplifier, 150 Watt input on carrier, with only 2 Watt drive, built-in 240V AC power supply, with input-output relays to by-pass linear on reception, optional Class C operation for FM and CW or Class B operation for SSB, twin-tetrode RCA 5894-B \$375

YAGI ANTENNA 9 elements 144-147 MHz, 9' boom with gamma-match fed radiator, perfect 52 or 75 ohm match, locally produced, complete \$30

POWER OUTPUT METERS

GALAXY RF-550-A 0-400 and 0-4000 W in line meters, with 6 position built-in coax switch \$75
SWAN VM-1500, 4 ranges 5 to 1500 Watt rf power in line meter \$50

NOISE BRIDGES OMEGA T antenna noise bridges, 0-100 MHz indispensable for intelligent antenna work, still only \$25

9 MHz CRYSTAL FILTERS with 2 USB/LSB carrier crystals, response curve and instructions for use per set \$30

TUBES

6KD6 Hitachi brand \$6.50
 6JS6 German, few left \$5
 6LF6, super type 6JS6 or 6KD6 \$7.50

TEN-TEC ARGONAUT 10 to 80 Metre 12V DC transceiver SW PEP SSB & CW, one sample only \$300
 Model 315 receiver, 10 to 80 Metre, with sharp CW filter 110 V AC operation, one sample only \$175

USED EQUIPMENT All in mint condition

DRAKE TR-4 with factory installed US \$120-noise-blanker RV-4 external VFO-speaker and 240V AC supply \$550

STC 25W output 2 Metre FM transceiver model WVT-25 12V DC operation, with PTT mike, crystals for channel B and Repeater 4 \$160

COLLINS 618 T 400 W SSB/AM transceiver, 29,000 channels with automatic antenna tuner at fraction of new cost \$1600

ALSO Ex RAAF 110 ft 10-section telescoping aluminium tower \$450

All prices quoted are net, cash with orders, basis Springwood N.S.W., sales tax included in all cases, subject to changes without prior notice. Freight, postage, packing & insurance are extras, sorry, no terms, credit or C.O.D., Proprietor Arle Bies.

SIDEBAND ELECTRONICS ENGINEERING

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TELEPHONE (STD 047) 51-1394

Private address 78 Chapman Parade, Faulconbridge

Contests

with Peter Brown VK4PJ

Federal Contests Manager, G.P.O. Box, 638
Brisbane Qld., 4001.

CONTEST CALENDAR

October 6, 7, VK-ZL Oceania 'phone Contest. Our International Contest.
October 13, 14, VK-ZL Oceania 'phone Contest. Do your bit.
October 13, 14, RSGB 21-28 MHz contest 'phone.
October 21, 22, RSGB 7 MHz CW
November 27, 28, CQ WW DX 'phone contest. One of the best.

November 3, 4, RSGB 7 MHz 'phone
November 11, Czechoslovak Central Radio Club Contest. Rules next month
November 24, 25, CQ WW DX CW Contest. Plenty of practice here
December 22, 23, Hungarian Contest.
October's one of the best contest months of the year. If one works hard I am sure they would achieve DXCC.

C Q World Wide DX Contest.

Phone October 27, 28 CW November 24, 25
Starts 0000 GMT Saturday Finishes 2400 GMT Sunday
All Bands. 1.8 through 25 MHz.
Exchange RS-RST plus your CQ Zone.
QSO point value

5 points between stations on different continents. 1 point between stations on the same continent but in different countries.

Contacts between stations in the same country are permitted for Zone and/or country multiplier, but have no QSO point value.

Final Score.

(a) Single band. Zoning plus countries by QSO points.
(b) All band. Sum of Zones plus sum of countries from each band by total QSO points.

Three Divisions.

Single Operator, single or all band
Multi-operator, single transmitter
Multi-operator, multi transmitter
Use a separate log sheet for each band. 40 contacts per band.

Indicate Zone and Country only the first time each is worked on each band. Logs to CQ World Wide Contest, 14 Vanderventer Ave., Port Washington, N.Y., USA, 11050. Usually Dec. 1st and Jan. 15th deadlines. Times GMT. Summary sheet giving all details.

Goings metzfo?

Herein is the Ross Hull scoring table with two metric conversions. One column which we will call "A" converts fairly closely but is not rounded off as well as "B".

Perhaps you have some better ideas which I will be pleased to hear. When you return your contest log put in "A" or a "B" to indicate your preference, but please do not consider just yourself. Consider what is best for the majority... and give an opinion.

Distance	Miles.	Kilometres
	"A"	"B"
Up to	25	40
	50	80
	100	160
	200	320
	400	640
	600	960
	800	1280
	1000	1600
	1500	2400
	2500	4000
	3500	5600
	5000	8000

Remembrance Day Contest

How'd it you find the Remembrance Day Contest this year? The opening address was received OK inters year at this QTH with any GRM.

I thought that it was a pretty slow start; my first 4 contacts were ZLs, but it soon developed into the same great contest... must be the world's best! I only made local on 10 metres and I don't think I was so good. VKs were going great guns. VK3QD Doug, having a bad VK4VU and VK4ED working well, VK7KJ, Greg was among the leaders I heard. Did not hear much from VK3 but I guess that VKs 2, 3, 6 & 9 will show up well in the final return.

I received over 100 logs in the first week from Carnarvon to New Guinea.

Ross Hull VHF UHF memorial contest 1973/4 rules

The Wireless Institute of Australia invites Amateurs and Short Wave Listeners to join in this annual contest which is held to perpetuate the memory of Ross Hull who did so much to further VHF/UHF.

A Personal Trophy is awarded annually for competition between members of the Wireless Institute of Australia and is inscribed with some details of the man the contest honours.

The name of the winning member of the Wireless Institute of Australia for each year is inscribed upon the trophy and that member also receives a suitably inscribed certificate.

Objects: Amateurs from Australia and Territories will endeavour to contact as many other Amateurs as possible under the following conditions:

Date of Contest 7th December 1973 1401 GMT, to 20th Jan. 1974, 1400 GMT. (0001 Hours E.S.T. to 30th December 1973 to 2400 Hours E.A.S.T. 20th Jan. 1974)

Duration: Any seven calendar days within the dates mentioned above which need not be consecutive.

These periods are at the operators convenience. A calendar day is from 1401 hrs GMT to 1400 hrs GMT.

RULES.

1. There are two Divisions, one of 48 hours duration and the other of seven days duration. In the seven day division there are four sections:

- (a) Transmitting, open.
- (b) Transmitting, phone.
- (c) Transmitting, C.W.
- (d) Receiving, open.

In the 48 hours division the best score over any consecutive 48 hour period is the winner.

In the seven day division the best score over any seven days of the Contest is the winner.

2. Any Amateur operating fixed, mobile or portable within the terms of his licence may participate.

3. All Amateur VHF/UHF bands may be used but cross band contacts are not acceptable. At any one time, single frequency operating only is permitted. Cross band contacts are permitted.

4. Amateurs may enter for any one of the sections and either or both divisions. The seven day division winner is not eligible for the 48 hour division award.

5. Two contacts per band per day, irrespective of mode, are permitted provided that two hours elapse from the previous contact with that station on that band.

6. Logs from a multi-operator station are not acceptable. One operator only may operate a station at any one time and must submit a log for his own operation.

Entrants must operate within the terms of their licence.

8. The exchange of RS or RST reports with aerial numbers beginning with 001 shall be proof of contact.

9. Entries should be set out on quarto sheets, using one side of the paper only, and must be forwarded to reach the Wireless Institute of Australia, Federal Contest Manager, G.P.O. Box 638 Brisbane 4001, in time for the first opening of logs on Friday 22nd February 1974. Envelopes should be clearly marked "Ross Hull Contest". Early logs are appreciated.

10. Scoring will be based on the attached table and the table of distances published in the Contests column of the issue of AR. Approximate distances are to be shown in the log. Operation via repeaters or translators is not permitted.

11. Logs should be set out as in the example and must carry a front sheet with the following information

12. All times are to be logged in GMT only.

13. Certificates will be awarded to the winners of each section of each call area. Certificates will be awarded to contestants who break any Australian VHF/UHF distance records.

The VK Contestant who returns the highest score in the transmitting section and who is a member of the WIA will have his name inscribed on the trophy which will be held by his Division for the prescribed period.

A certificate will be awarded to the operator with the highest 48 hour score.

RECEIVING SECTION

1. Short wave listeners only may enter for this section.

2. Contact times and logging of stations will be the same as for the transmitting section except that there will not be a 48 hour Division.

3. Logs must show the call sign of the calling station, the serial number given, and only the call sign of the other station. Scoring will be as for transmitting stations.

4. Any scoring contacts may be logged. There is no limit to the number of times that a station may be logged provided serial numbers are given.

5. The logs for any 7 days (calendar) may be submitted and the winner of the section will be the highest scorer.

6. Certificates will be awarded to the highest scorer in the contest and if sufficient interest is shown, to State winners.

7. A certificate will be awarded to the club station with the highest 7 day score.

General

It is preferable that complete logs be submitted as they aid in checking for contestants must clearly show their best 7 days or 48 hours. Envy yourself in another Friendly Contest. Try and exchange names with each contact.

SCORING TABLE

Distances	52 Mhz.	144 Mhz.	430 Mhz.	978 Mhz.	Higher
Up to 25 miles	1	1	2	5	10
26 to 50 ..	1	1	5	10	25
51 to 100 ..	5	5	15	30	75
101 to 200 ..	10	10	25	50	100
201 to 300 ..	25	15	50	150	250
301 to 500 ..	50	25	100	250	300
501 to 1000 ..	10	35	200	300	350
1001 to 1500 ..	15	100	350	350	400
1501 to 2500 ..	25	250	300	450	500
2501 to 3500 ..	35	200	400	500	600
3501 to 5000 ..	50	300	450	550	650
5001 to over ..	100	400	500	600	700

(When we change over to metric, these distances will be changed so you won't always be just in or just out of a range.)

EXAMPLE OF VK4 TRANSMITTING LOG

Date	Time Band	Emi- GNT	sta- tion	Call Sign	RST Sent	RST Recd.	Dist. Miles	Pts
Dec. 24	1400	52	A3(a)	VK7ZAB	58001	57022	1234	15
	1404	52	A3(a)	VK4QV	57002	56004	350	25
	1534	144	A3	VK3ZD	58003	58043	980	35
	1655	144	A3	VK3ZHD	45004	57008	775	10

EXAMPLE OF VK6 S.W.L. RECEIVING LOG

Date	Time Band	Call GNT	Heard	RST Sent	Station Called	Dist. Miles	Pts
Jan. 2	1207	52	VK5ZG	58087	VK3OK	1330	15
	1408	52	VK3ZD	58044	VK3OB	2450	25
	1815	432	VK3ZD	58044	VK3OB	60	15
	2309	144	VK3RF	47004	VK5ZG	1330	100

Comments

DISTANCE TABLE FOR ROSS HULL MEMORIAL V.H.F. CONTACT

Computer Great Circle distances with first order corrections for non-spherical earth shape. Accuracy ± 2 miles.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	0	1172	885	2019	1001	586	1905	1636	1827	304	722	644	408	238	708	1328	1075	720	1108	2003	608
2	1172	0	1235	3141	2133	1062	2936	1795	2817	1468	1065	1642	1515	1286	1940	238	2116	1891	2074	3071	1887
3	885	1235	0	2586	1312	1217	2588	801	2530	1719	1534	1645	1175	1061	1269	1341	1057	1362	1889	2647	1264
4	2019	3141	2586	0	1434	1434	472	2207	658	1659	1530	1589	1634	1869	1331	3536	1719	1344	2088	3027	1362
5	1001	2133	1312	1434	0	589	1571	1773	1770	901	1126	1032	864	1018	366	2246	213	471	604	1569	508
6	586	1905	1217	1434	589	0	1375	1699	1533	227	538	437	230	426	223	1934	830	156	1322	1447	116
7	1905	2936	2588	472	1571	1375	0	3252	192	1515	274	1307	1500	1707	1347	3147	1889	1335	2254	1597	1325
8	1636	1795	801	3007	1773	1699	3252	0	3280	1973	2323	2230	1865	1868	1946	1624	1508	1593	1168	3321	1891
9	1827	2817	2530	1658	1770	1533	192	3280	0	4348	1161	2235	1622	1617	1337	3051	1918	1312	2285	383	1389
10	304	1468	1719	1059	901	327	1515	1973	4348	0	389	289	30	200	549	1669	1085	478	1319	1621	463
11	722	1065	1534	1508	1126	538	1274	2332	1611	389	0	103	374	402	382	1873	1364	658	1030	1400	817
12	644	1642	1445	1508	1032	437	2307	2236	1205	268	103	0	275	418	641	1843	1264	564	1538	1431	526
13	408	1515	1175	1634	864	200	1506	1655	1429	30	374	275	0	229	512	1695	1051	440	1287	1632	405
14	238	1286	1061	1860	1018	498	1707	1668	1617	208	450	418	229	0	707	1489	1156	642	1330	1817	811
15	708	1940	1269	1341	3536	1719	1344	1658	1429	549	382	641	512	707	0	2090	685	77	995	1506	116
16	1328	2133	1269	2088	1569	1126	2274	1611	1682	1682	1682	1682	1682	1682	1682	0	2198	2047	1314	3273	2635
17	1108	2003	1889	3027	1569	1126	1611	1682	1682	1682	1682	1682	1682	1682	1682	2198	0	731	375	1871	785
18	720	1108	1269	2088	1569	1126	1611	1682	1682	1682	1682	1682	1682	1682	1682	1682	2198	0	1052	1385	38
19	1108	2003	1889	3027	1569	1126	1611	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	2198	0	2245	1010
20	2003	3071	2647	3071	1569	1126	1611	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	2198	0	1385
21	608	1887	1264	1362	508	116	1326	1861	1300	443	817	525	405	411	111	2025	765	38	1091	1385	0

1-Adelaide	5-Brisbane	9-Dunedin	14-M. Gambier	18-Townsville
2-Albany	6-Canberra	10-Geelong	15-Newcastle	19-Townsville
3-Alice Springs	7-Christchurch	11-Hobart	16-Perth	20-Wellington
4-Auckland	8-Derwin	12-Launceston	17-Rochampton	21-Wollongong
		13-Melbourne		

Awards Column

with BRIAN AUSTIN VK5CA
P.O. Box 7A, Craigh, SA, 5162

The following Awards are offered by JARL to any HAM or SWL in the world in his/her amateur life. The applicant must submit QSLs fulfilling the conditions of the Award applied for, and a list showing the date and time (GMT) of QSOs, type of emission and frequency used, signal report, and location of the stations contacted.

All claims for these Awards should be made by the submission of the QSLs, together with the list as mentioned above, and ten IRCs for each certificate except HAC which requires five. If the list has been certified by the Awards Manager of an IARU member society, confirmations (QSL cancel) are not required to be sent. Address for the application: JARL Awards Manager, P.O. Box 377, Tokyo Central, Japan.

All contacts between HAMs or reported by SWLs must have been made on or after 30th July 1952. Any authorised amateur band and type of emission may be used, but no crossband contacts will be allowed. The applicant must have worked under their local regulations. A. contacts must be with "land station". Contacts with ships, anchored or otherwise, and aircraft do not count. All stations must be contacted from the same call area, where such areas exist or from the same country in cases where there are no call areas.

REQUIREMENTS

ALL JAPAN DISTRICTS: QSO with all JA-JH-JR-JE call areas, 1 through 0, SWL-AJD for SWLs.
WORKED ALL JAPAN PREFECTURES: QSO with JA-JH-JR-JE station in All 47 Japanese Prefectures shown in the attached list. HAJA for SWLs.
JAPAN CENTURY CITIES: QSO with over 100 JA-JH-JR-JE stations in different cities in Japan. JCC-200, -300, -400, -500, -600 are also issued as special Awards. A set of 600 is available on your request (3 IRCs needed). SWL-JCC for SWLs.
HEARD ALL CONTINENTS: This Award is issued to any SWL who gets confirmation of amateur stations in all six different continents, for his/her reception records.

AS AN DX AWARD: This Award has been instituted to encourage co-operation and friendship of radio amateurs between Asia and other continents of the world. The ADXA for confirmed contacts with 30 different Asian countries including JA-JH-JR-JE (except KA) is available to licensed amateurs everywhere in the world. SWL ADXA for SWLs.
WORKED ALL CITIES AWARD: QSO with JA-JH-JR-JE stations in all Japanese cities. HACA for SWLs. Obsolete cities are not included.

Country list of ADXA.

AC3	UJ8
AC4	UL7
AS1 (Bhutan)	UM6
AP (East)	VG1-9M4-V51
AV (West)	(Singapore)
BV-C3	VS1-9M2, 4
BY-C	(West Malaysia)
C3	VS2-9M2
CR8 (Dense, Diu)	(Malaysia)
CR9	V58
CR8 (Goat)	V59
EP-EQ	V58K
F18 (French Indo China)	W59H
HM-HL	V58M-8QA
HS	VU (And'n & Nic'r IS)
HZ-7Z	VU (Laccadive)
JA-JH-JR-JE	XU
JP-KG1	XV-SW8
(Ogasawara Is.)	XV8
JT	X22
JY	YK
KR6, 8	YI
	Y5
MP48	Z20S-4X1
MP4Q	159 (Sprey Is.)
MP4M-VS90	457
MP4T	4W1
OQ6	5B4-ZC4
TA	824
UAS, D	9K2
UD6	9K3-825
UR6-4L7	9N1
UC8-4J7	
UB8	
UB	

List of WAJA-HAJA

Districts Prefectures	
JA1 Tokyo, Kanagawa, Chiba, Saitama, Ibaraki, Tochigi, Gunma, Yamaguchi	
JA2 Shizuoka, Gifu, Aichi, Mie	
JA3 Kyoto, Shiga, Nara, Osaka, Wakayama, Hyogo, Okayama, Shimane, Yamaguchi, Tottori, Hiroshima	
JA4 Kagawa, Tokushima, Ehime, Kochi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, Okinawa (JRN6)	
JA5 Aomori, Iwate, Akita, Yamagata, Miyagi, Fukushima	
JA6 Hokkaido	
JA7 Toyama, Fukui, Ishikawa	
JA8 Niigata, Nagano	

Jamboree on the air

10TH AUSTRALIAN SCOUT JAMBOREE WOODHOUSE, SOUTH AUSTRALIA 28TH DECEMBER 1973 - 6TH JANUARY, 1974.

Friday, December 28th, 1973, will be a memorable day for South Australia.

On that day, 10,000 Scouts from all States of Australia and a number of overseas countries, will assemble for the start of the 10th Australian Scout Jamboree.

For 10 days, the South Australian Branch Training Centre, at Woodhouse, in the Adelaide Hills, will become South Australia's fifth largest "city".

During this time, the South Australian Scout Amateur Station "VK5BP" will be operating from the Jamboree site.

The station will commence transmission at 0230 GMT on Sunday, December 30th and will operate 24 hours a day until 1030 GMT on Saturday, 6th January, 1974.

The station will be equipped with three SSB Transmitters covering all bands, two transmitters will be operating simultaneously on separate bands while the third will be in "filaments on" condition in case of failure of either of the operating equipments. Each transmitter will operate for 16 hours on air, and 8 hours on standby to give equal usage of all equipment.

The basic operating frequencies will be:-

180 metre	2.819 MHz
80 metre	3.825 MHz
40 metre	7.050 MHz
20 metre	14.190 MHz
15 metre	21.180 MHz
10 metre	28.180 MHz

Dependent on frequency being clear of use

Propagation Conditions from day to day will determine the two bands in operation.

Three Aerial Systems will be in use:-
1) A Portable Quad for 20, 15, 10 metres.
2) Dipoles at 90 degrees for 80, 40, 20 metres.
3) Long wire for 160 through 10 metres.
It is hoped that many stations around the world will take part, thus ensuring that the operation of the JAMBOREE Station will be a success.

STOP PRESS

Les Marmo, Victorian Branch Officer of JOTA passed along an interesting letter by Alan Reid, VK3AHR which was unfortunately received too late for inclusion in this issue. Alan recommends quick short overs, SSB style, with pre-arranged skeds and only "loud and clear" copy—no technical jargon.

CLUB/ZONE/DIVISION NEWS

● The Publications Committee wishes to advise that the call on AR for space to print material is so great it is not possible to include a section devoted to Divisional, Zone or Club news.

● Arrangements were made with all Divisions that such news would appear in Divisional Bulletins. If so required, and accepted by Divisional Bulletin Editors, Bulletins, when submitted, are carried as inserts in AR mailed to members of the Division concerned.

● It has been agreed however that AR should include an Events Diary to contain very brief details of forthcoming events. Items for this Diary must reach the Editor not later than the 1st of the month prior to publication.

ESSENTIAL BOOKS

HOW TO MAKE WALKIE-TALKIES FOR LICENSED OPERATION

PRINCIPLES OF ELECTRICITY & MAGNETISM A complete course on this basic subject for the student, electronics engineer, and amateur who wishes to improve his knowledge. As supplied to Universities, Technical Colleges etc. 532 pages. Harcourt. Fully illustrated. Published at £810. Special offer of **A89**

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Booksellers, Wholesalers and
Radio Stores,

Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

Dear Sir,

Re "JOTA"

I have a suggestion concerning Scout participation in "JOTA", and would appreciate any publicity you may care to arrange.

I have the approval of our Branch Organizer, Mr Ray Lawrence, and am writing you on his authority.

The idea is to have three, one hour segments, on each of the three nights, Friday 19th, Saturday 20th and Sunday 21st October, 7.30, from 0500 hrs to 1000 hrs G.M.T.

During these segments, the Adult Leaders - "Scouters" - could feel free to talk to other Scouts, swapping ideas, comparing campsites etc., and at the same time gaining valuable experience - which should have immediate value to the "Boys"...

Another point is that I feel there may be some Radio Amateurs who, for one reason or another, have not had, or cannot have a number of Boys, in their "shack" - but who may be delighted to take some part in JOTA. At least, say, a couple of Scouts for one hour?

The Scout Association certainly appreciates the Services provided by Radio Amateurs, and I hope my suggestion will be accepted in the spirit that it was made, to the benefit of all concerned.

We will have Scouts available here at the suggested times, seeking other Scout contacts, and already have an 80 metre shack with a blind operator near Sydney.

Need I mention that Watchpots Scouts will be on the air throughout the JOTA weekend, and some of our OS's could again be while mobile.

Yours faithfully,
Jim Griffith the VK2BGG,
Group Leader
2nd Watchpots Group.

The Editor.

Dear Sir,
Concerning an item entitled "Unusual Problems" in QSP Page 9 of July 1973, I can help you with an explanation of the construction methods used on the Balcadden Kite T.V. Transmitter project as I was employed as a foreman with the contractors.

The answer to your query is that it was primarily a helicopter engineering construction project: in other words, helicopters were used as flying cranes and trucks.

All materials for the ropeway towers and the transmitter building were flown to altitudes of 5000 feet up the mountain side, the steel towers were rigged by helicopter and a lot of the concrete for foundations were premixed at base camp and poured by helicopters hovering over the formwork.

The power line towers were fabricated in three sections, flown in and rigged by air. Aerials for the power line and eight haul ropes of nylon for the heavier track and haul cables of the ropeway were strung by helicopter.

Operational control of ground and flying operations was by HF & VHF radio telephone and army telephones.

A very interesting colour film by the Commonwealth Works Department is available for conventions and was shown at the recent North Queensland Convention at Townsville.

73
Tud Gifford
VK4YG.

Dear Sir,

Re: Mobile Whips AR March 1973

Due to the volume of mail regarding the above:

1. Errata Tabulation 1. Could you repeat the tabulation correctly as the feedback has not been noticed. Giving Col. 3 the heading Diameter Mills instead of Radius.

2. The foregoing dimensions are artist readings from micrometer and rule.

3. The wire sizes are overall sizes including insulation thickness so check the wire overall size looking for a suitable gauge; there possibly will be 2 to 8 mile variation in the "standard" gauges available.

4. The criteria as always is wire length so measure off the necessary amount plus and wind that on.

5. Have heard that Estopel may be a good claim electric to use for the coating of whips if you do not wish to shrink sleeve it.

73,
Doug Pennell, VK6EP-VK6SP

Editor.

Dear Sir,
On reading Max Hult's history in a recent "ART" I am reminded of a piece of radio history that is probably only known to a few Members.

In 1927 there was a break-away group of Amateurs from the WIA led by Queensland's own A. Feenaghy. I don't remember his call sign, but he called the break-away "The Australian Radio Transmitters League" (ARTL) in Victoria the VRTL, was formed as a branch under the leadership of the late Jack King VK3JQ (then DA3JQ). I was Communications Manager, and under the call sign OA3WH I won an 80 metre com. communications contest inaugurated by the ARTL in 1928. It was the great big Queensland event when A. Feenaghy was presented with a pennant commemorating the occasion by Leo at the QTH of the then WIA Secretary, Bruce Hardie. It was here that Bruce persuaded Leo to amalgamate with the WIA, as this was done in 1929. Regrettably this pennant along with my other radio equipment was destroyed at Beaumaris in the bunfire of 1944.

Hope that this is of some interest.
Yours Fraternally,
AIF Chandler, VK3LC.

The Editor.

Dear Sir,
Reference your mention of the availability of slow wave tapes on page 4 of the August issue of Amateur Radio. The following information may be of interest. Source of information: - Page 24 of the March 1973 issue of the N.Z.A.R.T. publication "Break-In".

Details: Morse Course - ZL1HV, 1970. In two sections: (1) eight 1 1/2 hour lessons for teaching Morse code. (2) 1 1/2 hours of practice Morse from 5 w.p.m. up to 16 w.p.m., plus some off-air Morse at high speed. The courses are accompanied with a written code. There will be more information next month. The lecture service is charged with returning the tapes by the due date. Tape lectures required, Recording required (i.e. tape or cassette). One week should be allowed for processing. Source of information: Page 67 of April 1973 "Break-In".

Details: Morse Code - As mentioned at conference in 1972, this scheme has obtained plans for teaching Morse code. The course is produced by Arthur Godfrey ZL1HV, is grouped into lessons of about 15 minutes, each lesson dealing with a certain group of letters. The whole course is very similar to that presented by Dr. A. W. Lewis, ZL3RT in April 1972, Braikiri and differing only in the grouping of some letters. The course is designed to teach Morse code, and only a knowledge of basic Morse code characters is

Each lesson consists of the characters under study being sent, followed by groups of letters. As each lesson progresses, the letters from the previous page are included in the groups so that knowledge and proficiency is built up as each lesson progresses, so aid recognition of characters at speed, the tapes are made by recording the Morse characters at a speed of 15 w.p.m., but the spacing is twice normal, thus giving the effect of fast characters but with "thinking" time in between.

The Morse course is divided into two parts for convenience. Part 1: Basic Morse course of 8, 15 minute lessons for teaching Morse code. Part 2: Practice exercises, from 5 w.p.m. up to 16 w.p.m. plus some high speed off-air Morse.

Each part has an accompanying written decode (except for high speed off-air Morse) for checking and correcting copy.

The Morse course is available through the Tape Lecture Service. Note that to keep costs down only one copy of the decodes is available with each tape, all extra copies are 25 cents each. Copies of the Morse course are available to any interested person at the following prices: Part 1: 2 hour cassette is twice \$8.00. Part 2: 1 1/2 hours cassette or 5" tape, \$4.00.

The information was extracted from The Novice Radio Training Scheme Column compiled by H. Whelan, ZL2BFR, P.O. Box 1716, Palmerston North, New Zealand.

73,
Lionel L. Sharpe, VK4NS

Intruder watch

With Alf Chondler VK3LC

WIRELESS INSTITUTE OF AUSTRALIA
Intruder Watch Summary for six months—January to June 1973

Frequency MHz	Mode	Average	Ident.	Traffic & Remarks	Reported by
20800	F1	0830	AXD	Teletype read-out	ZLIBAD
21022	A1	0630	4CWA	BIYJ de 4CWA QSV K.	VK4KC
21022	A1	0700	BIYJ	.. de BIYJ GSA nil.	4KC
21023	A1	0520	AXD	.. de BIYJ groups.	4PB
21023	F1	1020	CUA49	.. vvv CUA49	4KC
21110	A1	0800	XSD	.. vvv de XSD QSV.	4KC
24000	A2	2020	Jammer	.. vvv DKL	4KC
24003	A1	2130	AXE	.. vvv AXE	4KC
24008	F1	0100	DXM	Teletype.	220
24008	A1	0115	058M	LXAJ de 058M QRK7.	220
24010	F1	0600	DXM	Teletype reports.	220
24003-15	A1	0630	3DN	Spurious from 13095.	220
24018	A1	1200	4CJL	JYFX de 4CJL.	220
24022-26	A1	0900	NAP	Musical note.	4KC
24024-31	A2	1200	Jammer.	.. vvv MIL	4KC
24030	A1	0530	MIL	.. vvv MIL	4KC
24036-40	A1	1200	AXE	.. vvv AXE	4KC
24037	A1	0730	UKCH	.. vvv CAW UKO SEA	4KC
24038	A1	0015	JANB	COE de URCH QTH Komsoel	4PB
24040	A1	0900	NAP	GBV de JANB.	220
24041	F1	1000	8702	YVY QSV 185000 QSV.	4KC
24048-59	A1	0700 1200	BT02	8212 de BT02.	4KC
24054	A1	1300	AXOE	7AJ de BT02.	4KC
24061	A1	2030	CLAS9	8FZS de AXOE	4KC
24060	F1	1900	—	4CJL de CLAS9 14054 QSV	4KC
24062	A1	0000	VKCL	Teletype.	4KC
24064	A1	0000	UHQF	UHQF de VKCL hj.	4KC
24064-68	A1	1030	RJF	UHQF de RJF.	4KC
24066	A1	1040	ULY4	RJF de ULY4.	4KC
24070	A1	1130	RJF2	UHQF de RJF2.	4KC
24071	F1	0700	UMG72	UHQF de UMG72 QSV	4KC
24081	A1	0800	OUW	.. de OUW figure gss.	4KC
24082	A1	1300	7AI	7BC de 7AI.	4KC
24085	A1	1100	JXK	.. vvv JXK	4KC
24086	F1	1000	K9KK	CTLZ de K9KK	4KC
24092	A1	2030	DAN	QZ de DAN.	4KC
24096	F1	0730	FHU	STTF c FHU.	4KC
24100	F1	0830 1200	TCX	Teletype read-outs.	4KC
24110	A1	0630	MJL8	4 letter code.	4KC
24111	A1	0700	RUC3	.. vvv RUC3	4KC
24112	F	2200	OMSEN	.. vvv OMSEN.	4KC
24129	A1	2200	JCOW	.. vvv JCOW	4KC
24130	F1	1300	—	Teletype	4KC
24132	F4	0500 0750	—	Facsimile.	4KC
24138	F4	0800	—	Facsimile.	4KC
24143-8	A1	0600	V3AU	V3ST de V3AU.	4KC
24143	F1	0830	BCX24	CO de BCX24 Taipei.	4KC
24147	A1	2300	RMS4	TBO de RMS4 db, coded traffic.	4KC
24148-9	F1	0630	—	Teletype.	4KC
24150	A1	1030	—	4 letter code.	4KC
24151-4	A1	0550	YF76	UKAR de YF76.	4KC
24152	A1	2000	—	4 letter code.	4KC
24152	A1	0830	ULY4	.. vvv ULY4.	4KC
24153	F1	0550	RJF2	.. vvv RJF2.	4KC
24160	A1	0030	BCX24	.. vvv BCX24 Taipei.	4KC

Finally, I would like to correct an anomaly with the VK4 monthly net as revealed to me here. It seems to be understood that the time is 6 p.m. whereas it is 7.30 p.m. on the first Monday of each month on 5850kHz.

I have been to the North Eastern Convention at Townsville inaugurated by the Townsville Amateur Radio Club, report which was included in September issue of "AR". As reported it was a success. My identification tape was played to an eager audience as well as a short talk, and I am sure that I have enticed some new observers from VK4. I have submitted for publication in this issue a summary of recurring intruders as extracted from my various summaries and they are as heretofore, also an explanation of some of the positive identifications known to me.

Remarks concerning Summary
3DN is a Fijian station located at Nadi airport emitting a spurious from 13095 kHz. Traffic varies, but mostly weather reports for Tonga, New Hebrides, Niue, Samoa, Gilbert & Christmas Islands. Calls 5WB who cannot be heard on the frequency.

7802; 7804; 7802 are Indonesian stations (Military) working point to point with 7AJ and 7WR who are not heard on the band. Send mostly plain language messages to the Indonesian language.
TCX was a Diplomatic station in Ankara, Turkey working with Tehran, Cyprus and other countries in Asia.
Recurring intruders reported before are:—
24026-15 3DN Fijl.
24021 NAP.
24023-8 7802; 7804; 7802 Indonesian.
24082 DAN.
24100 YCX Turkey.
24157 YF76.
24152 ULY4.
7010 7025 7035 7050 7075 7085 7095 Radio Peking

Address by Mr Myles F.E. Wright, Chairman, Australian Broadcasting Control Board, to open the 26th Remembrance Day Contest, August, 1973.

I am very pleased to have been invited to open the 26th Remembrance Day Contest of the Wireless Institute — not least because I notice that it involves amateur operators in Australia and New Zealand. As a New Zealander by birth I am pleased to make a special reference to the operators from Maori land and particularly to any listening in my own home town of Wellington.

Having been involved for about half of my working life in the "professionals" side of radio — in front of the microphone as well as behind a desk — I can understand the attraction which radio holds for "amateur" operators. I have heard it said that radio hams could more conveniently (and frequently) conduct their "water stations" using the modern telephone system. I can fully understand their position: it is not the same thing to talk over the telephone to a single capable listener, but to broadcast a message to an unseen and unknown audience far transcends the mere telephone call. And in addition — with the true radio "hams" — there is the technical challenge.

I trust that this challenge to invest-gate and invent new techniques is not completely lost now that such elaborate professional amateur radio stations if they will excuse the paradox can be purchased off the shelf as it were. I do sincerely hope that there are still amateurs who are not only building their own equipment but building it in new ways to operate on the newer wave bands.

It was this technical inventiveness and the thorough technical knowledge which it developed that fitted "hams" so well for the duty so many undertook during War years — too many of them now names on the Remembrance Day trophy.

In my present position as Chairman of the Australian Broadcasting Control Board it would be remiss of me if I failed to refer to the duty so many undertook during War years — too many of them now names on the Remembrance Day trophy.

You are all aware of the dreaded initials "T.V.I."! With colour television services beginning in New Zealand in only a few weeks and in Australia in about eighteen months, interference from amateur transmissions to television programmes is under careful scrutiny.

The Board's engineers tell me that there is very ready co-operation from "hams" in minimizing interference to television. However, viewers will be investing large sums in their new colour television sets, so we can expect an increase in their reaction to any marring of quality in their reception.

(Continued next page)

Ionospheric Predictions

with Bruce Batho, VK3AGE October 73

This month's predictions from information supplied by the Ionospheric Prediction Service Division indicate point to point band openings for at least 50% of the month.

Times are G.M.T.

28 MHz	
VK3	G S.P. 0800-0900 (possible 40%)
"	VE3 2000-2300 (possible 40%)
"	UA 0400-0500 (possible 40%)
"	VK9 2400-0400
"	W6 2000-0300 (possible 40%)
"	JA 0100-0500
VK4	
"	SU 0400
"	KH8 2000-0800
"	VE3 S.P. 1900-2300 (possible 40%)
"	UA 0500-0800 (possible 40%)
"	W6 2100-0200
"	JA 2200-0800
VK6	
"	SU 0600
"	KH8 2200-0800 (possible 40%)
"	ZS 0500-0700 (possible 40%)
"	G S.P. 0700-1200 (possible 40%)

21 MHz	
VK3	SU 0400-1000
"	ZS 0400-0900
"	G S.P. 0700-1000
"	UA 0400-1000
"	W6 2000-0300
VK4	
"	SU 0400-1000
"	ZS 0400-0900
"	G S.P. 0900-1400
"	L.P. 0800-0900
"	UA 0400-1300
"	W6 1900-0200
VK6	
"	SU 0400-1200
"	ZS 0400-1200
"	G S.P. 0600-1200
"	L.P. 1000
"	UA 0400-1200
"	W6 2200-0300

14 MHz	
* VK2, 3, 4, 7, 10:	
"	ZL 1900-1300
"	SU 1100-1000
"	KH8 0400-0700
"	ZS 0400-0700, 1100-1300
"	G S.P. 0700-1900
"	G L.P. 0800-1200, 2000-2400
"	VK0 2000-1200
"	VE3 S.P. 1300-2000
"	VE3 L.P. 0700-1800
"	UA 0700-1800
"	W1 0700-1300-1900
"	VK9 2400-2400
"	PY 2000-1200
"	W6 0400-0800, 1400-2000
"	JA 0500-1700, 2100-2400
"	9G1 S.P. 1500-1700, 2000-0200
"	L.P. 0400-1100, 1500-2000

* Average over whole of east coast.

Times are approximate	
VK5	
"	SU 1100-1800, 2100-0100
"	ZS 0300, 0800, 1100-1300
"	G S.P. 0700-1800
"	L.P. 0800-1300, 2100-2200
"	W6 0400-0500, 1500-2000
VK6	
"	SU 1100-1800, 2100-0100
"	ZS 0300, 1100-1500
"	G S.P. 0900-1900
"	L.P. 0800-1300
"	UA 0200-0900, 1900
"	W6 1800-1800, 2100

7 MHz	
VK2	
"	SU 1500-2100
"	ZS 1600-2000
"	G S.P. 1500-2000
"	L.P. 0800
"	UA 1300-2000
"	W6 0700-1500
"	PY 0800-0900
VK6	
"	SU 1500-2300
"	ZS 1500-2300
"	G S.P. 1800-2300
"	UA 1400-2300
"	W6 1000-1800
"	PY 2100-2200

Sunsets: Numbers Predictions: September 30, October 22, November 28, December 24, January 22.
—mean for July, 1973 — 20.4.

Hamads

- * Eight lines free to all W.I.A. members.
- * \$5 per 3 cms. for other amateurs and S.W.L's.
- * Copy should be in block letters or typewritten, signed and forwarded to The Editor, P.O. Box 150, Toorak, Vic. 3142.
- * Excludes commercial advertising.
- * Closing date for Hamads is the 3rd day of the month preceding publication.
- * QTHR means the advertiser's name and address are correct in the current Australian Callbook.

WANTED TO SELL

Edgemoor 758 with "B" meter and speaker #110.
G. Stann, 96 Stuart Street, Blakelhurst, 2221.
Ph.: (02) 548 4114 (after 4 p.m. Mon-Fri.).

Geloso GA/225, 200W 588 Tx brand new in original carton, \$300. O.H.O. VK3AGX. Ph.: 233 1261 after 6 p.m.

Brake 28 Receiver, Matching Oxer 5PKR Unit, 100-10 metres, perfect condition, \$200. VK3ARZ. QTHR. (03) 232-9492.

S&B Transceiver Versa FDX400, including manual and accessories, \$395. Excellent condition. VK2BMM. QTHR.

Ocilliloscope, 3 inch Astor 1, with probes. Good condition, \$35. Ph. (03) 85-4662. VK3BFW. QTHR.

Newell Packard Variable Attenuator Model 89A 1000 to 200MHz, 4 to 120 DB \$30.00, also Eto. Gen. Model 614 AR, 800 to 2100 MHz. \$200; VK6PK. Box 348, Carnarvon, 6701.

General Coverage RF 150kHz - 20MHz, AR6 Front End, Double Conv., AM/SSB CW, good working order. Extn. Spkr., Circuit. \$65. O.N.O. T.Hambling, 86 Bayview Street, Williamstown, Vic., 3016. Ph.: (03) 597-6772.

AMR 900 RC, 1.5-24 MHz, excellent condition, \$70. O.N.O. Valves, all new, 77, 6C8, A310, A615, 24A, 56Z, H. Leopold, 9 Hyland Avenue, Darlington, S.A., 5047. Ph.: (08) 402-4040.

VHF (30 to 300MHz) Signal Generator with calibrated output attenuator to one microvolt or less. (Eric Gray—VK3ZS—QTHR—Bus: 403) 630-5655 A.H. (83) 25-3249.

FT800 with gear supply and microphone, as new condition. Can be heard on air, \$325. O.N.O. VK373 QTHR. Ph.: (058) 82-1635.

FT4H, T43 & rotor \$640 C1-16 dual beam CRO \$245. HA-500A. Sx. 1000. Farnham Street, Bentley, W.A. Ph.: (092) 58-7115.

WANTED

Slow Scan Television Monitor wanted. Details to ZL3AAV, P.O. Box 22, Wairoa, New Zealand.

ART Coil Box To make up set. Important C.D.E.: VK3ZNZ. QTHR.

Collins PS40 or PS43, R105 or 51H3 Collins or AR860. CV233/ALR Converter or RS08/ARC RX; coil boxes A.C.D.E. for 820 AWA C55/14 Exoca SFP7. Schematic or handbook for No. 62, 22, TR 1934 or TR 1935. State condition and price to H. Leopold, 9 Hyland Avenue, Darlington, S.A., 5047. Ph.: (082) 85-4245.

Instruction Manual, RCA AR860 Receiver (723K-30185). To buy or borrow, for copying, J. Hanes, 17150 Queen Victoria Street, Bexley, 2207.

My Board is anxious to ensure that viewers derive the greatest benefit possible from the purchase of their expensive colour television sets and the technical staffs of the Board and of the Post Office will be ready to help both the public and the amateur radio operators (either individually or collectively through the Wireless Institute) in solving the T.V.I. problems which will arise when colour services begin.

The one important advantage which this natural resource possesses, compared with many of the other resources, is that the radio spectrum is not irreversibly consumed. It may be mis-used but wise management and co-operation between users the position can be recovered.

Now, in the case of the spectrum, I believe that the broadcasting users and the amateur radio users have a common complaint: that they do not have sufficient channels. At the same time we both must keep our own houses in order to ensure that we use the channels which we do have to the very greatest advantage and that we do not cause trouble to our neighbours. We must develop good housekeeping methods, reduce the amount of pollution or rubbish which we produce and, above all, we must attempt to keep our pollution within our own backyard.

Silent Keys

A. H. Tilse—VK4WO
R. H. Vickary, VK4VX

W. J. Zech, VK2ACP

Bill passed away on August 9th at Blue Mountains Hospital after a short illness. He was one of the oldest licensed amateurs in Australia, having held a ticket for 61 years.
D. A. Cliff, VK2DC

20 Years Ago

with Ron Fisher VK3OM

October 1953.

Tucked away in one of the back pages of the October 1953 issue of Amateur Radio is an epoch making notice. The United ACP was named as such by the PMG's Department. They stated that where application was made, a Limited certificate would be granted to those candidates who passed the technical and regulations sections of ACP examinations held since the 1st of January 1953.

Back in the 1950's when plenty of high power transmitting components were available from disposals sources, many amateurs constructed transmitters capable of running well over the 100 watt limit of that time. The 160 watt limit came later. Many of these amateurs, although complying with the law, ran into trouble with PMG Radio Inspectors who would not approve operation of the gear. After Federal recognition to the Radio Branch, the following was published: "It is confirmed that the Department will not object to the use of such combined components so long as the final stages of the transmitter is so operated that the licensed input power of 100 watts cannot be exceeded without a major change to the equipment providing the d.c. operating voltages and aerial loading facilities".

The Editorial page for October 1953 was concerned with the 'Status' of the amateur operator in the eyes of the general public. It was pointed out that most other hobbyists were well known and perhaps understood to some extent by the average citizen, whereas amateur radio operators were looked on as 'crazy cranks'. Perhaps even after twenty years we still have a way to go yet to correct this impression.

Technical articles for October included, 'Multi-Band Tuning Unit' by Joe Rogers VK3JO. The system used two tuned circuits, one covering 80 and 40 metres the other tuning 20, 15 and 10. Although the L-C ratio was something of a compromise, the whole thing could be made to work fairly well.

The 'Gamma' Match was described by E. Gabriel VK2VAG and a Simple Low Level Audio Peak Clipper by J. C. Watson VK6JW.

Reine Conductor 600 Wattifier Power Transformers by V. J. McMillan VK2VAM showed how to use disposals transformers with 110 volt input in series for 230 volt operation.

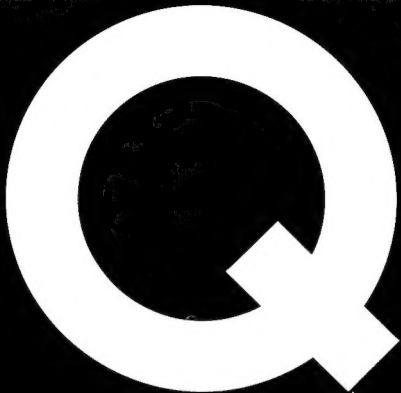
DX Activity page was taken over by Hans VK3AHH the first time. Fairly good conditions were reported on all except the 15 and 10 metre bands.

As many of you will know, this simple housekeeping in the radio spectrum sense is now being promoted as a specialized topic within the field of radio engineering with the elaborate title of Electromagnetic Compatibility.

No doubt we shall all be hearing a great deal more about it in the future.

In conclusion, let me, on behalf of the broadcasting fraternity in this our Golden Jubilee year, acknowledge the role which the radio amateurs in Australia and as a group have played in the development of radio services generally in Australia and in New Zealand. In particular let us recall the important role your members played, and the sacrifices they made, during the War years.

And now I have great pleasure in declaring on the Remembrance Day Contest. I hope it is a very great success.



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